Journal of MOLECULAR BIOLOGY

EDITOR-IN-CHIEF
J. C. KENDREW

ASSISTANT EDITOR
S. BRENNER

EDITORIAL BOARD
C. R. Cantor
P. Chambon
W. W. Franke
M. Gellert
G. A. Gilbert
M. Gottesman
I. Herskowitz
R. Huber
H. E. Huxley
A. Klug
V. Luzzati
J. H. Miller
M. F. Moody
K. Simons

VOLUME 166

5 May to 5 June 1983

ACADEMIC PRESS
London New York San Francisco

Copyright © 1983, by Academic Press Inc. (London) Ltd.

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

CONTENTS OF VOLUME 166

Number 1, 5 May 1983

Gough, J. A. and Murray, N. E., Sequence Diversity among Related Genes for Recognition of Specific Targets in DNA Molecules 1

Brisson, A. and Wade, R. H., Three-dimensional Structure of Luminal Plasma Membrane Protein from Urinary Bladder 21

Rossmann, M. G., Abad-Zapatero, C., Hermodson, M. A. and Erickson, J. W., Subunit Interactions in Southern Bean Mosaic Virus . . . 37

Appendix I: Rossmann, M. G., Chandrasekaran, R., Abad-Zapatero, C., Erickson, J. W. and Arnott, S., RNA–Protein Binding in Southern Bean Mosaic Virus 73

Appendix II: Silva, A., Rossmann, M. G. and Abad-Zapatero, C., Quality of the Electron Density Map 80

Letters to the Editor

Vorlíčková, M., Skelnář, V. and Kypr, J., Salt-induced Conformational Transition of Poly[d(A-T)]·poly[d(A-T)] . . . 85

Gronenborn, A. M., Clore, G. M. and Gronenborn, B., Protection Against Nuclease Cleavage of pBR322 DNA by the cAMP Receptor Protein of *Escherichia coli* 93

Lebrun, E., Foriers, A., Hoebeke, J., Strosberg, D. and van Rapenbusch, R., Crystallization and Preliminary X-ray Diffraction Studies of the Mitogenic Lentil (*Lens culinaris*) Lectin . . . 99

Number 2, 15 May 1983

Snyder, M. and Davidson, N., Two Gene Families Clustered in a Small Region of the *Drosophila* Genome 101

McEwen, B. F., Ceska, T. A., Crepeau, R. H. and Edelstein, S. J., Structural Changes in Tubulin Sheets Upon Removal of Microtubule-associated Proteins. 119

Strehler, E. E., Carlsson, E., Eppenberger, H. M. and Thornell, L.-E., Ultrastructural Localization of M-band Proteins in Chicken Breast Muscle as Revealed by Combined Immunochemistry and Ultramicrotomy 141

Udvardy, A. and Schedl, P., Structural Polymorphism in DNA . . . 159

Shakked, Z., Rabinovich, D., Kennard, O., Cruse, W. B. T., Salisbury, S. A. and Viswamitra, M. A., Sequence-dependent Conformation of an *A*-DNA Double Helix. The Crystal Structure of the Octamer d(G-G-T-A-T-A-C-C) 183

Letters to the Editor

Lewis, B. A. and Engelman, D. M., Bacteriorhodopsin Remains Dispersed in Fluid Phospholipid Bilayers Over a Wide Range of Bilayer Thicknesses 203

Lewis, B. A. and Engelman, D. M., Lipid Bilayer Thickness Varies with Acyl Chain Length in Fluid Phosphatidylcholine Vesicles . . 211

Stewart, M. and Roberts, G. C. K., Nuclear Magnetic Resonance Evidence for a Flexible Region at the C-Terminus of α-Tropomyosin 219

Wollack, J. B. and Erlanger, B. F., Conformations of Oligonucleotides in Solution as Determined by Sequence-specific Antibodies 227

Court, D., Huang, T. F. and Oppenheim, A. B., Deletion Analysis of the Retroregulatory Site for the *λint* Gene 233

Shaw, D. J., Rice, D. W. and Guest, J. R., Homology between CAP and Fnr, a Regulator of Anaerobic Respiration in *Escherichia coli* . 241

Fornells, M., Campos, J. L. and Subirana, J. A., Changes of Conformation of DNA Produced by Mechanical Forces . . . 249

Announcement 253

Erratum 255

Number 3, 25 May 1983

Banerjee, P. T., Olson, W. H., Allison, D. P., Bates, R. C., Snyder, C. E. and Mitra, S., Electron Microscopic Comparison of the Sequences of Single-stranded Genomes of Mammalian Parvoviruses by Heteroduplex Mapping. 257

Taylor, R. K., Hall, M. N. and Silhavy, T. J., Isolation and Characterization of Mutations Altering Expression of the Major Outer Membrane Porin Proteins Using the Local Anaesthetic Procaine . . 273

Wanner, B. L., Overlapping and Separate Controls on the Phosphate Regulon in *Escherichia coli* K12 283

Rosenthal, E. T., Tansey, T. R. and Ruderman, J. V., Sequence-specific Adenylations and Deadenylations Accompany Changes in the Translation of Maternal Messenger RNA after Fertilization of *Spisula* Oocytes 309

KUBOTA, K., CHU, B., FAN, S.-F., DEWEY, M. M., BRINK, P. and COLFLESH, D. E., Quasi-elastic Light Scattering of Suspensions of *Limulus* Thick Myofilaments in Relaxed (long) Activated and Rerelaxed (short) States 329

DRIEDONKS, R. A. and CALDENTEY, J., Gene *20* Product of Bacteriophage T4. II. Its Structural Organization in Prehead and Bacteriophage . . 341

NESS, P. J., LABHART, P., BANZ, E., KOLLER, T. and PARISH, R. W., Chromatin Structure along the Ribosomal DNA of *Dictyostelium*. Regional Differences and Changes Accompanying Cell Differentiation . 361

KAO, T.-J., MILLER, D. L., ABO, M. and OFENGAND, J., Formation and Properties of a Covalent Complex between Elongation Factor Tu and Phe-tRNA Bearing a Photoaffinity Probe on its 3-(3-Amino-3-carboxypropyl)uridine Residue 383

OCHI, H., HATA, Y., TANAKA, N., KAKUDO, M., SAKURAI, T., AIHARA, S. and MORITA, Y., Structure of Rice Ferricytochrome *c* at 2·0 Å Resolution . 407

DICKERSON, R. E., Base Sequence and Helix Structure Variation in *B* and *A* DNA 419

Appendix: Helix comparison tables 434

LETTERS TO THE EDITOR

HENRY, E. R., SOMMER, J. H., HOFRICHTER, J. and EATON, W. A., Geminate Recombination of Carbon Monoxide to Myoglobin . . 443

BRICK, P., OLLIS, D. and STEITZ, T. A., Crystallization and 7 Å Resolution Electron Density Map of the Large Fragment of *Escherichia coli* DNA Polymerase I 453

NUMBER 4, 5 JUNE 1983

WILSON, V., JEFFREYS, A. J., BARRIE, P. A., BOSELEY, P. G., SLOCOMBE, P. M., EASTON, A. and BURKE, D. C., A Comparison of Vertebrate Interferon Gene Families Detected by Hybridization with Human Interferon DNA 457

DUNN, J. J. and STUDIER, F. W., Complete Nucleotide Sequence of Bacteriophage T7 DNA and the Locations of T7 Genetic Elements . 477

MICHELS, P. A. M., LIU, A. Y. C., BERNARDS, A., SLOOF, P., VAN DER BIJL, M. M. W., SCHINKEL, A. H., MENKE, H. H., BORST, P., VEENEMAN, G. H., TROMP, M. C. and VAN BROOM, J. H., Activation of the Genes for Variant Surface Glycoproteins 117 and 118 in *Trypanosoma brucei* . 537

HANAHAN, D., Studies on Transformation of *Escherichia coli* with Plasmids . 557

WILLIAMS, R. W., Estimation of Protein Secondary Structure from the Laser Raman Amide I Spectrum 581

EGELMAN, E. H., FRANCIS, N. and DEROSIER, D. J., Helical Disorder and the Filament Structure of F-Actin are Elucidated by the Angle-layered Aggregate 605

Appendix: EGELMAN, E. H. and DEROSIER, D. J., A Model for F-Actin Derived from Image Analysis of Isolated Filaments 623

ŠTROP, P. and WÜTHRICH, K., Characterization of the Proteinase Inhibitor IIA from Bull Seminal Plasma by ^{1}H Nuclear Magnetic Resonance. Stability, Amide Proton Exchange and Mobility of Aromatic Residues. 631

ŠTROP, P., WIDER, G. and WÜTHRICH, K., Assignment of the ^{1}H Nuclear Magnetic Resonance Spectrum of the Proteinase Inhibitor IIA from Bull Seminal Plasma by Two-dimensional Nuclear Magnetic Resonance 641

Appendix: FRANK, G., Reinvestigation of the C-terminal End in the Amino Acid Sequence of the Proteinase Inhibitor IIA from Bull Seminal Plasma 665

ŠTROP, P., ČECHOVÁ, D. and WÜTHRICH, K., Preliminary Structural Comparison of the Proteinase Isoinhibitors IIA and IIB from Bull Seminal Plasma Based on Individual Assignments of the ^{1}H Nuclear Magnetic Resonance Spectra by Two-dimensional Nuclear Magnetic Resonance at 500 MHz 669

SHARMA, V. S., Studies of Human Hemoglobin Intermediates. The Double Mixing Method for Studying the Reactions of the Species $Hb_4(CO)$ and $Hb_4(CO)_2$ 677

LETTER TO THE EDITOR

DOSCHER, M. S., MARTIN, P. D. and EDWARDS, B. F. P., Crystals of a Catalytically Defective, Semisynthetic Ribonuclease Isomorphous with Those of the Fully Active Parent Enzyme 685

ERRATA 689

Index to Volume 166

Abad-Zapatero, C. (see also Rossmann, M. G.), 37, 73
— (see also Silva, A.), 80
Abo, M. (see also Kao, T.-J.), 383
F-Actin, a model derived from image analysis of isolated filaments, 623
—, helical disorder and the filament structure are elucidated by the angle-layered aggregate, 605
Acyl chain length shows linear variation with lipid bilayer thickness, in fluid phosphatidylcholine vesicles, 211
Adenylations and deadenylations, sequence-specific, accompany changes in the translation of maternal mRNA after fertilization of *Spisula* oocytes, 309
Aihara, S. (see also Ochi, H.), 407
Allison, D. P. (see also Banerjee, P. T.), 257
Amide I Raman spectrum, use in estimation of protein secondary structure, 581
3-(3-Amino-3-carboxypropyl) uridine residue of Phe-tRNA, bearing a photoaffinity probe; formation and properties of a covalent complex between elongation factor Tu and the Phe-tRNA, 383
Anaerobic respiration in *Escherichia coli*, homology between regulator Fnr and CAP, 241
Angle-layered aggregate elucidates helical disorder and the filament structure of F-actin, 605
Antibodies, sequence-specific, use in determination of conformations of oligonucleotides in solution, 227
Arnott, S. (see also Rossmann, M. G.), 73
Aromatic residue mobility; characterization of the proteinase inhibitor IIA from bull seminal plasma by ^{1}H n.m.r., 631

Bacteriophage T4 gene *20* product, its structural organization in prehead and bacteriophage, 341
— T7, complete nucleotide sequence of DNA, and the locations of T7 genetic elements, 477
Bacteriorhodopsin remains dispersed in fluid phospholipid bilayers over a wide range of bilayer thicknesses, 203
Banerjee, P. T., Olson, W. H., Allison, D. P., Bates, R. C., Snyder, C. E. & Mitra, S., Electron microscopic comparison of the sequences of single-stranded genomes of mammalian parvoviruses by heteroduplex mapping, 257
Banz, E. (see also Ness, P. J.), 361
Barrie, P. A. (see also Wilson, V.), 457
Bates, R. C. (see also Banerjee, P. T.), 257
Bernards, A. (see also Michels, P. A. M.), 537
Bilayer, lipid, thickness varies linearly with acyl chain length in fluid phosphatidylcholine vesicles, 211
—, phospholipid, fluid, bacteriorhodopsin remains dispersed in, over a wide range of bilayer thicknesses, 203
Bladder, urinary, three-dimensional structure of luminal plasma membrane protein, 21
Borst, P. (see also Michels, P. A. M.), 537
Boseley, P. G. (see also Wilson, V.), 457
Brick, P., Ollis, D. & Steitz, T. A., Crystallization and 7 Å resolution electron density map of the large fragment of *Escherichia coli* DNA polymerase I, 453
Brink, P. (see also Kubota, K.), 329
Brisson, A. & Wade, R. H., Three-dimensional structure of luminal plasma membrane protein from urinary bladder, 21
Bull seminal plasma, assignment of the ^{1}H n.m.r. spectrum of the proteinase inhibitor IIA by two-dimensional n.m.r. at 500 MHz, 641
— — —, characterization of the proteinase inhibitor IIA by ^{1}H n.m.r.; stability, amide proton exchange and mobility of aromatic residues, 631
— — —, preliminary structural comparison of the proteinase inhibitors IIA and IIB, based on individual assignments of the ^{1}H n.m.r spectra by two-dimensional n.m.r. at 500 MHz, 669
— — —, reinvestigation of the C-terminal end in the amino acid sequence of the proteinase inhibitor IIA, 665
Burke, D. C. (see also Wilson, V.), 457

Caldentey, J. (see also Driedonks, R. A.), 341
cAMP receptor protein of *Escherichia coli* protects against nuclease cleavage of pBR322 DNA, 93
Campos, J. L. (see also Fornells, M.), 249
CAP, homology with Fnr, a regulator of anaerobic respiration in *Escherichia coli*, 241
Carbon monoxide, geminate recombination to myoglobin, 443
Carlsson, E. (see also Strehler, E. E.), 141
Čechová, D. (see also Štrop, P.), 669
Ceska, T. A. (see also McEwen, B. F.), 119
Chandrasekaran, R. (see also Rossmann, M. G.), 73
Chicken breast muscle, ultrastructural localization of M-band proteins as revealed by combined immunochemistry and ultramicrotomy, 141
Chromatin structure along the ribosomal DNA of *Dictyostelium*; regional differences and changes accompanying cell differentiation, 361
Chu, B. (see also Kubota, K.), 329
Clore, G. M. (see also Gronenborn, A. M.), 93
Clustering of two gene families in a small region of the *Drosophila* genome, 101
Colflesh, D. E. (see also Kubota, K.), 329
Conformation changes of DNA produced by mechanical forces, 249
—, sequence-dependent, of an *A*-DNA double helix. The crystal structure of the octamer d(G-G-T-A-T-A-C-C), 183
— of oligonucleotides in solution as determined by sequence-specific antibodies, 227
Conformational transition, salt-induced, of poly[d(A-T)] · poly[d(A-T)], 85
Court, D., Huang, T. F. & Oppenheim, A. B., Deletion analysis of the retroregulatory site for the *λint* gene, 233
Crepeau, R. H. (see also McEwen, B. F.), 119
Crosslinking of elongation factor Tu to Phe-tRNA bearing a photoaffinity probe on its 3-(3-amino-3-carboxypropyl)uridine residue, 383
Cruse, W. B. T. (see also Shakked, Z.), 183
Crystallization and 7 Å resolution electron density map of the large fragment of *Escherichia coli* DNA polymerase I, 453
— — preliminary X-ray diffraction studies of the mitogenic lentil (*Lens culinaris*) lectin, 99
Crystals of a catalytically defective, semisynthetic ribonuclease isomorphous with those of the fully active parent enzyme, 685
C-terminal end in the amino acid sequence of the proteinase inhibitor IIA from bull seminal plasma, a reinvestigation, 665
C-terminus flexible region for α-tropomyosin, n.m.r. evidence, 219

Davidson, N. (see also Snyder, M.), 101
Deletion analysis of the retroregulatory site for the *λint* gene, 233
DNA, *B* and *A*, base sequence and helix structure, 419
— of bacteriophage T7, complete nucleotide sequence and the locations of T7 genetic elements, 477
— conformation, changes produced by mechanical forces, 249
—, interferon, human, a comparison with vertebrate gene families detected by hybridization, 457
— molecules, and sequence diversity among related genes for recognition of specific targets, 1
—, pBR322, protection against nuclease cleavage by the cAMP receptor protein of *Escherichia coli*, 93
— polymerase I from *Escherichia coli*, crystallization and 7 Å resolution electron density map of the large fragment, 453
—, ribosomal, of *Dictyostelium*, chromatin structure; regional differences and changes accompanying cell differentiation, 361
— structural polymorphism, 159
A-DNA double helix, sequence-dependent conformation; the crystal structure of the octamer d(G-G-T-A-T-A-C-C), 183
DeRosier, D. J. (see also Egelman, E. H.), 605, 623
Dewey, M. M. (see also Kubota, K.), 329
d(G-G-T-A-T-A-C-C) crystal structure; sequence-dependent conformation of an *A*-DNA double helix, 183
Dickerson, R. E., Base sequence and helix structure variation in *B* and *A* DNA, 419
Dictyostelium, chromatin structure along the ribosomal DNA; regional differences and changes accompanying cell differentiation, 361
Doscher, M. S., Martin, P. D. & Edwards, B. F. P., Crystals of a catalytically defective, semisynthetic ribonuclease isomorphous with those of the fully active parent enzyme, 685

Double helix, *A*-DNA, sequence-dependent conformation; the crystal structure of the octamer d(G-G-T-A-T-A-C-C), 183
— mixing method for studying the reactions of the species $Hb_4(CO)$ and $Hb_4(CO)_2$; studies of human hemoglobin intermediates, 677
Driedonks, R. A. & Caldentey, J., Gene *20* product of bacteriophage T4. II. Its structural organization in prehead and bacteriophage, 341
Drosophila genome, two gene families clustered in a small region, 101
Dunn, J. J. & Studier, F. W., Complete nucleotide sequence of bacteriophage T7 DNA and the locations of T7 genetic elements, 477

Easton, A. (see also Wilson, V.), 457
Eaton, W. A. (see also Henry, E. R.), 443
Edelstein, S. J. (see also McEwen, B. F.), 119
Edwards, B. F. P. (see also Doscher, M. S.), 685
Egelman, E. H. & DeRosier, D. J., A model for F-actin derived from image analysis of isolated filaments (*Appendix* to Egelman, E. H. *et al.*, 605), 623
—, Francis, N. & DeRosier, D. J., Helical disorder and the filament structure of F-actin are elucidated by the angle-layered aggregate, 605
Electron density map, 7 Å resolution, of the large fragment of *Escherichia coli* DNA polymerase I, 453
— microscopic comparison of the sequences of single-stranded genomes of mammalian parvoviruses by heteroduplex mapping, 257
Elongation factor Tu, formation and properties of a covalent complex with Phe-tRNA bearing a photoaffinity probe on its 3-(3-amino-3-carboxypropyl)uridine residue, 383
Engelman, D. M. (see also Lewis, B. A.), 203, 211
Eppenberger, H. M. (see also Strehler, E. E.), 141
Erickson, J. W. (see also Rossmann, M. G.), 37, 73
Erlanger, B. F. (see also Wollack, J. B.), 227
Escherichia coli cAMP receptor protein protects against nuclease cleavage of pBR322 DNA, 93
— — DNA polymerase I, crystallization and 7 Å resolution electron density map of the large fragment, 453
— — Fnr, a regulator of anaerobic respiration, homology with CAP, 241
— — K12, overlapping and separate controls on the phosphate regulon, 283
— — transformation with plasmids, 557
Expression of the major outer membrane porin proteins, isolation and characterization of altering mutations using the local anaesthetic procaine, 273

Fan, S.-F. (see also Kubota, K.), 329
Ferricytochrome *c* from rice, structure at 2·0 Å resolution, 407
Fertilization of *Spisula* oocytes is followed by changes in the translation of material mRNA accompanied by sequence-specific adenylations and deadenylations, 309
Filament structure and helical disorder of F-actin are elucidated by the angle-layered aggregate, 605
Flexible region at the C-terminus of α-tropomyosin, n.m.r. evidence, 219
Fnr, a regulator of anaerobic respiration in *Escherichia coli*, homology with CAP, 241
Foriers, A. (see also Lebrun, E.), 99
Fornells, M., Campos, J. L. & Subirana, J. A., Changes of conformation of DNA produced by mechanical forces, 249
Francis, N. (see also Egelman, E. H.), 605
Frank, G., Reinvestigation of the C-terminal end in the amino acid sequence of the proteinase inhibitor IIA from bull seminal plasma (*Appendix to* Štrop, P. *et al.*, 641), 665

Geminate recombination of carbon monoxide to myoglobin, 443
Gene activation for variant surface glycoproteins 117 and 118 in *Trypanosoma brucei*, 537
— families, interferon, vertebrate, detected by hybridization, a comparison with human interferon DNA, 457
— families, two, clustered in a small region of the *Drosophila* genome, 101
—, *λint*, deletion analysis of the retroregulatory site, 233
— *20* product of bacteriophage T4: its structural organization in prehead and bacteriophage, 341
Genes, related, sequence diversity for recognition of specific targets in DNA molecules, 1
Genetic element locations in complete nucleotide sequence of T7 DNA, 477
Genomes, single-stranded, of mammalian parvoviruses, electron microscopic comparison of the sequences by heteroduplex mapping, 257

Gough, J. A. & Murray, N. E., Sequence diversity among related genes for recognition of specific targets in DNA molecules, 1
Gronenborn, A. M., Clore, G. M. & Gronenborn, B., Protection against nuclease cleavage of pBR322 DNA by the cAMP receptor protein of *Escherichia coli*, 93
Groneborn, B. (see also Gronenborn, A. M.), 93
Guest, J. B. (see also Shaw, D. J.), 241

^{1}H n.m.r. characterization of the proteinase inhibitor IIA from bull seminal plasma; stability, amide proton exchange and mobility of aromatic residues, 631
— spectra of the proteinase inhibitors IIA and IIB from bull seminal plasma, individual assignments by two-dimensional n.m.r. at 500 MHz; preliminary structural comparison, 669
— spectrum of the proteinase inhibitor IIA from bull seminal plasma, assignment by two-dimensional n.m.r. at 500 MHz, 641
Hall, M. N. (see also Taylor, R. K.), 273
Hanahan, D., Studies on transformation of *Escherichia coli* with plasmids, 557
Hata, Y. (see also Ochi, H.), 407
$Hb_4(CO)$ and $Hb_4(CO)_2$, the double mixing method for studying the reactions, 677
Helical disorder and the filament structure of F-actin are elucidated by the angle-layered aggregate, 605
Helix structure variation and base sequence in *B* and *A* DNA, 419
Hemoglobin intermediates, human; the double mixing method for studying the reactions of the species $Hb_4(CO)$ and $Hb_4(CO)_2$, 677
Henry, E. R., Sommer, J. H., Hofrichter, J. & Eaton, W. A., Geminate recombination of carbon monoxide to myoglobin, 443
Hermodson, M. A. (see also Rossmann, M. G.), 37
Heteroduplex analysis of mammalian parvoviral single-stranded genomes, electron microscopic comparison of sequences, 257
Hoebeke, J. (see also Lebrun, E.), 99
Hofrichter, J. (see also Henry, E. R.), 443
Huang, T. F. (see also Court, D.), 233
Human hemoglobin intermediates; the double mixing method for studying the reactions of the species $Hb_4(CO)$ and $Hb_4(CO)_2$, 677
— interferon DNA, a comparison with vertebrate interferon gene families detected by hybridization, 457
Hybridization detection of vertebrate interferon gene families, and a comparison with human interferon DNA, 457

Image analysis of isolated filaments, use in derivation of a model for F-actin, 623
Immunochemistry and ultramicrotomy, combined, reveal ultrastructural localization of M-band proteins in chicken breast muscle, 141
Interferon gene families, vertebrate, detected by hybridization, a comparison with human interferon DNA, 457

Jeffreys, A. J. (see also Wilson, V.), 457

Kakudo, M. (see also Ochi, H.), 407
Kao, T.-J., Miller, D. L., Abo, M. & Ofengand, J., Formation and properties of a covalent complex between elongation factor Tu and Phe-tRNA bearing a photoaffinity probe on its 3-(3-amino-3-carboxypropyl)uridine residue, 383
Kennard, O. (see also Shakked, Z.), 183
Koller, T. (see also Ness, P. J.), 361
Kubota, K., Chu, B., Fan, S.-F., Dewey, M. M., Brink, P. & Colflesh, D. E., Quasi-elastic light scattering of suspensions of *Limulus* thick myofilaments in relaxed (long) activated and rerelaxed (short) states, 329
Kypr, J. (see also Vorlíčková, M.), 85

Labhart, P. (see also Ness, P. J.), 361
λint gene, deletion analysis of the retroregulatory site, 233
Laser Raman amide I spectrum, use in estimation of protein secondary structure, 581
Lebrun, E., Foriers, A., Hoebeke, J., Strosberg, D. & van Rapenbusch, R., Crystallization and preliminary X-ray diffraction studies of the mitogenic lentil (*Lens culinaris*) lectin, 99

Lectin from *Lens culinaris*, crystallization and preliminary X-ray diffraction studies, 99
Lens culinaris lectin, crystallization and preliminary X-ray diffraction studies, 99
Lentil (*Lens culinaris*) lectin, crystallization and preliminary X-ray diffraction studies, 99
Lewis, B. A. & Engelman, D. M., Bacteriorhodopsin remains dispersed in fluid phospholipid bilayers over a wide range of bilayer thicknesses, 203
, Lipid bilayer thickness varies with acyl chain length in fluid phosphatidylcholine vesicles, 211
Light scattering, quasi-elastic, of suspensions of *Limulus* thick myofilaments in relaxed (long) activated and rerelaxed (short) states, 329
Limulus thick myofilaments in relaxed (long) activated and rerelaxed (short) states, quasi-elastic light scattering, 329
Lipid bilayer thickness varies linearly with acyl chain length in fluid phosphatidylcholine vesicles, 211
Lui, A. Y. C. (see also Michels, P. A. M.), 537
Local anaesthetic procaine, use in isolation and characterization of mutations altering expression of the major outer membrane porin proteins, 273
Luminal plasma membrane protein from urinary bladder, three-dimensional structures, 21

McEwen, B. F., Ceska, T. A., Crepeau, R. H. & Edelstein, S. J., Structural changes in tubulin sheets upon removal of microtubule-associated proteins, 119
Mammalian parvoviruses, electron microscopic comparison of the sequences of single-stranded genomes by heteroduplex mapping, 257
Martin, P. D. (see also Doscher, M. S.), 685
M-band proteins, ultrastructural localization in chicken breast muscle as revealed by combined immunochemistry and ultramicrotomy, 141
Mechanical forces can change the conformation of DNA, 249
Membrane protein from urinary bladder, three-dimensional structure, 21
Menke, H. H. (see also Michels, P. A. M.), 537
Messenger RNA, maternal, translation changes after fertilization of *Spisula* oocytes are accompanied by sequence-specific adenylations and deadenylations, 309
Michels, P. A. M., Liu, A. Y. C., Bernards, A., Sloof, P., Van Der Bijl, M. M. W., Schinkel, A. H., Menke, H. H., Borst, P., Veeneman, G. H., Tromp, M. C. & Van Broom, J. H., Activation of the genes for variant surface glycoproteins 117 and 118 in *Trypanosoma brucei*, 537
Microtubule-associated proteins, their removal produces structural changes in tubulin sheets, 119
Miller, D. L. (see also Kao, T.-J.), 383
Mitra, S. (see also Banerjee, P. T.), 257
Morita, Y. (see also Ochi, H.), 407
Murray, N. E. (see also Gough, J. A.), 1
Muscle, chicken breast, ultrastructural localization of M-band proteins as revealed by combined immunochemistry and ultramicrotomy, 141
Mutations altering expression of the major outer membrane porin proteins, isolation and characterization using the local anaesthetic procaine, 273
Myofilaments of *Limulus* in relaxed (long) activated and rerelaxed (short) states, quasi-elastic light scattering of suspensions, 329
Myoglobin, geminate recombination of carbon monoxide, 443

Ness, P. J., Labhart, P., Banz, E., Koller, T. & Parish, R. W., Chromatin structure along the ribosomal DNA of *Dictyostelium*. Regional differences and changes accompanying cell differentiation, 361
Nuclear magnetic resonance evidence for a flexible region at the C-terminus of α-tropomyosin, 219
Nuclease cleavage of pBR322 DNA, protection against, by the cAMP receptor protein of *Escherichia coli*, 93
Nucleotide sequence, complete, of bacteriophage T7 DNA and the locations of T7 genetic elements, 477

Ochi, H., Hata, Y., Tanaka, N., Kakudo, M., Sakurai, T., Aihara, S. & Morita, Y., Structure of rice ferricytochrome *c* at 2·0 Å resolution, 407
Ofengand, J. (see also Kao, T.-J.), 383
Oligonucleotides in solution, conformations determined by sequence-specific antibodies, 227
Ollis, D. (see also Brick, P.), 453
Olson, W. H. (see also Banerjee, P. T.), 257
Oppenheim, A. B. (see also Court, D.), 233

based on individual assignments of the ^{1}H n.m.r. spectra by two-dimensional n.m.r. at 500 MHz, 669
— organization of T4 gene *20* product in prehead and bacteriophage, 341
– polymorphism in DNA, 159
Structure of chromatin along the ribosomal DNA of *Dictyostelium*: regional differences and changes accompanying cell differentiation, 361
— — rice ferricytochrome *c* at 2·0 Å resolution, 407
–, secondary, of protein, estimation from the laser Raman amide I spectrum, 581
—, three-dimensional, of luminal plasma membrane protein from urinary bladder, 21
– variation in helices, and base sequence, in *B* and *A* DNA, 419
Studier, F. W. (see also Dunn, J. J.), 477
Subirana, J. A. (see also Fornells, M.), 249
Subunit interactions in southern bean mosaic virus, 37

T4 (see also Bacteriophage), 341
T7 (see also Bacteriophage), 477
Tanaka, N. (see also Ochi, H.), 407
Tansey, T. R. (see also Rosenthal, E. T.), 309
Taylor, R. K., Hall, M. N. & Silhavy, T. J., Isolation and characterization of mutations altering expression of the major outer membrane porin proteins using the local anaesthetic procaine, 273
Thornell, L.-E. (see also Strehler, E. E.), 141
Transformation of *Escherichia coli* with plasmids, 557
Translation of maternal mRNA, changes after fertilization of *Spisula* oocytes are accompanied by sequence-specific adenylations and deadenylations, 309
Tromp, M. C. (see also Michels, P. A. M.), 537
α-Tropomyosin, n.m.r. evidence for a flexible region at the C-terminus, 219
Trypanosoma brucei, activation of the genes for variant surface glycoproteins 117 and 118, 537
Tubulin sheets, structural changes upon removal of microtubule-associated proteins, 119

Udvardy, A. & Schedl, P., Structural polymorphism in DNA, 159
Ultramicrotomy and immunochemistry, combined, reveal ultrastructural localization of M-band proteins in chicken breast muscle, 141
Ultrastructural localization of M-band proteins in chicken breast muscle as revealed by combined immunochemistry and ultramicrotomy, 141

Van Broom, J. H. (see also Michels, P. A. M.), 537
— Der Bijl, M. M. W. (see also Michels, P. A. M.), 537
— Rapenbusch, R. (see also Lebrun, E.), 99
Variant surface glycoprotein 117 and 118 in *Trypanosoma brucei*, activation of the genes, 537
Veeneman, G. H. (see also Michels, P. A. M.), 537
Vertebrate interferon gene families detected by hybridization, comparison with human interferon DNA, 457
Virus, southern bean mosaic, RNA–protein binding, 73
—, — — —, subunit interactions, 37
Viswamitra, M. A. (see also Shakked, Z.), 183
Vorlíčková, M., Skelnář, V. & Kypr, J., Salt-induced conformational transition of poly[D(A-T)]·poly[D(A-T)], 85

Wade, R. H. (see also Brisson, A.), 21
Wanner, B. L., Overlapping and separate controls on the phosphate regulon in *Escherichia coli* K12, 283
Wider, G. (see also Štrop, P.), 641
Williams, R. W., Estimation of protein secondary structure from the laser Raman amide I spectrum, 581
Wilson, V., Jeffreys, A. J., Barrie, P. A., Boseley, P. G., Slocombe, P. M., Easton, A. & Burke, D. C., A comparison of vertebrate interferon gene families detected by hybridization with human interferon DNA, 457
Wollack, J. B. & Erlanger, B. F., Conformations of oligonucleotides in solution as determined by sequence-specific antibodies, 227
Wüthrich, K. (see also Štrop, P.), 631, 641, 669

X-ray diffraction studies, preliminary, of the mitogenic lentil (*Lens culinaris*) lectin, 99

based on individual assignments of the ^{1}H n.m.r. spectra by two-dimensional n.m.r. at 500 MHz, 669
— organization of T4 gene *20* product in prehead and bacteriophage, 341
— polymorphism in DNA, 159
Structure of chromatin along the ribosomal DNA of *Dictyostelium*; regional differences and changes accompanying cell differentiation, 361
— — rice ferricytochrome *c* at 2·0 Å resolution, 407
—, secondary, of protein, estimation from the laser Raman amide I spectrum, 581
—, three-dimensional, of luminal plasma membrane protein from urinary bladder, 21
— variation in helices, and base sequence, in *B* and *A* DNA, 419
Studier, F. W. (see also Dunn, J. J.), 477
Subirana, J. A. (see also Fornells, M.), 249
Subunit interactions in southern bean mosaic virus, 37

T4 (see also Bacteriophage), 341
T7 (see also Bacteriophage), 477
Tanaka, N. (see also Ochi, H.), 407
Tansey, T. R. (see also Rosenthal, E. T.), 309
Taylor, R. K., Hall, M. N. & Silhavy, T. J., Isolation and characterization of mutations altering expression of the major outer membrane porin proteins using the local anaesthetic procaine, 273
Thornell, L.-E. (see also Strehler, E. E.), 141
Transformation of *Escherichia coli* with plasmids, 557
Translation of maternal mRNA, changes after fertilization of *Spisula* oocytes are accompanied by sequence-specific adenylations and deadenylations, 309
Tromp, M. C. (see also Michels, P. A. M.), 537
α-Tropomyosin, n.m.r. evidence for a flexible region at the C-terminus, 219
Trypanosoma brucei, activation of the genes for variant surface glycoproteins 117 and 118, 537
Tubulin sheets, structural changes upon removal of microtubule-associated proteins, 119

Udvardy, A. & Schedl, P., Structural polymorphism in DNA, 159
Ultramicrotomy and immunochemistry, combined, reveal ultrastructural localization of M-band proteins in chicken breast muscle, 141
Ultrastructural localization of M-band proteins in chicken breast muscle as revealed by combined immunochemistry and ultramicrotomy, 141

Van Broom, J. H. (see also Michels, P. A. M.), 537
— Der Bijl, M. M. W. (see also Michels, P. A. M.), 537
— Rapenbusch, R. (see also Lebrun, E.), 99
Variant surface glycoprotein 117 and 118 in *Trypanosoma brucei*, activation of the genes, 537
Veeneman, G. H. (see also Michels, P. A. M.), 537
Vertebrate interferon gene families detected by hybridization, comparison with human interferon DNA, 457
Virus, southern bean mosaic, RNA–protein binding, 73
—, — — —, subunit interactions, 37
Viswamitra, M. A. (see also Shakked, Z.), 183
Vorlíčková, M., Skelnář, V. & Kypr, J., Salt-induced conformational transition of poly[d(A-T)]·poly[d(A-T)], 85

Wade, R. H. (see also Brisson, A.), 21
Wanner, B. L., Overlapping and separate controls on the phosphate regulon in *Escherichia coli* K12, 283
Wider, G. (see also Štrop, P.), 641
Williams, R. W., Estimation of protein secondary structure from the laser Raman amide I spectrum, 581
Wilson, V., Jeffreys, A. J., Barrie, P. A., Boseley, P. G., Slocombe, P. M., Easton, A. & Burke, D. C., A comparison of vertebrate interferon gene families detected by hybridization with human interferon DNA, 457
Wollack, J. B. & Erlanger, B. F., Conformations of oligonucleotides in solution as determined by sequence-specific antibodies, 227
Wüthrich, K. (see also Štrop, P.), 631, 641, 669

X-ray diffraction studies, preliminary, of the mitogenic lentil (*Lens culinaris*) lectin, 99